

Reshaping Agricultural Production: Geography, Farm Structure, and Finances

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“Farming, Finance, and the Global Marketplace”

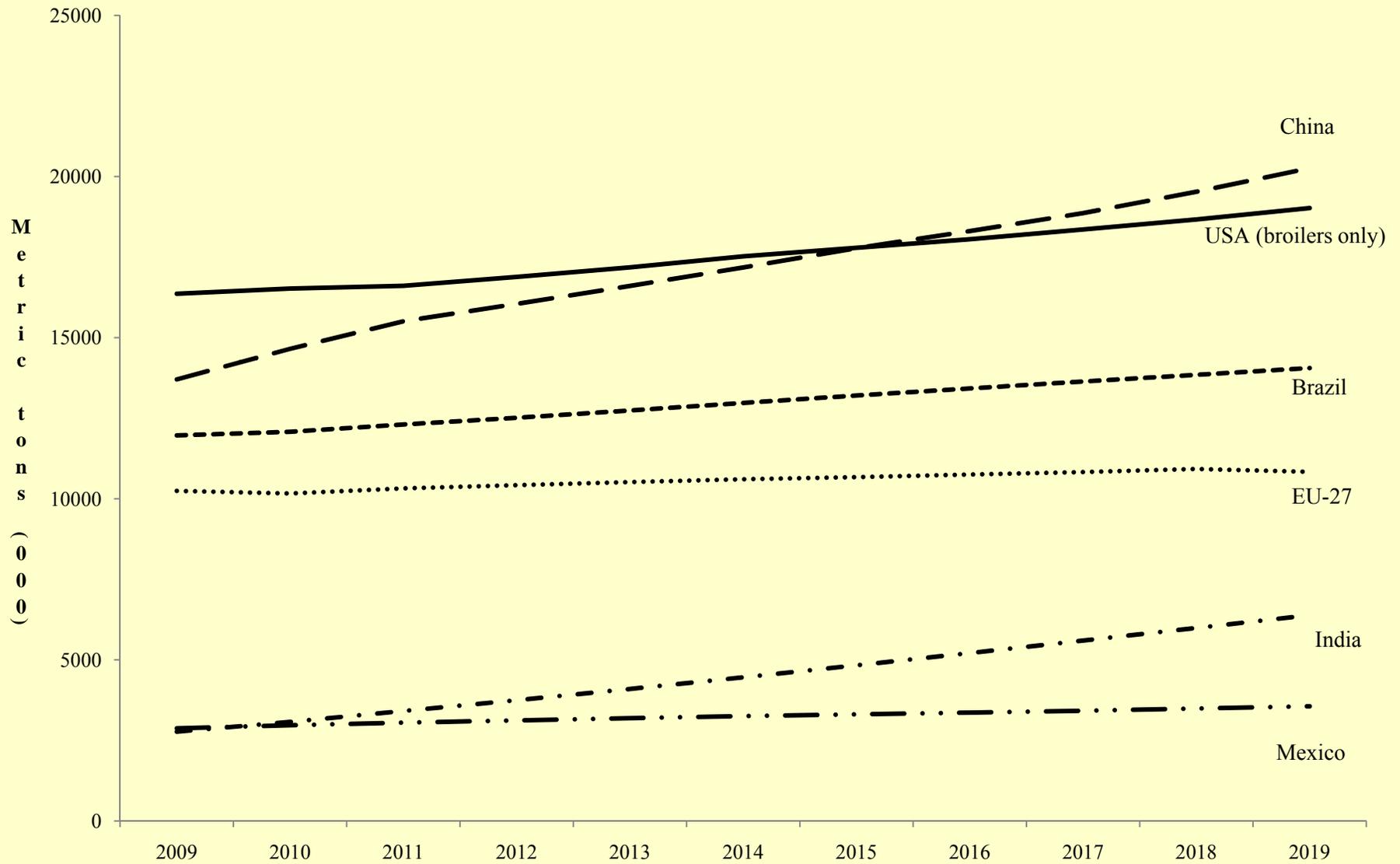
Kansas City, Missouri, June 8, 2010



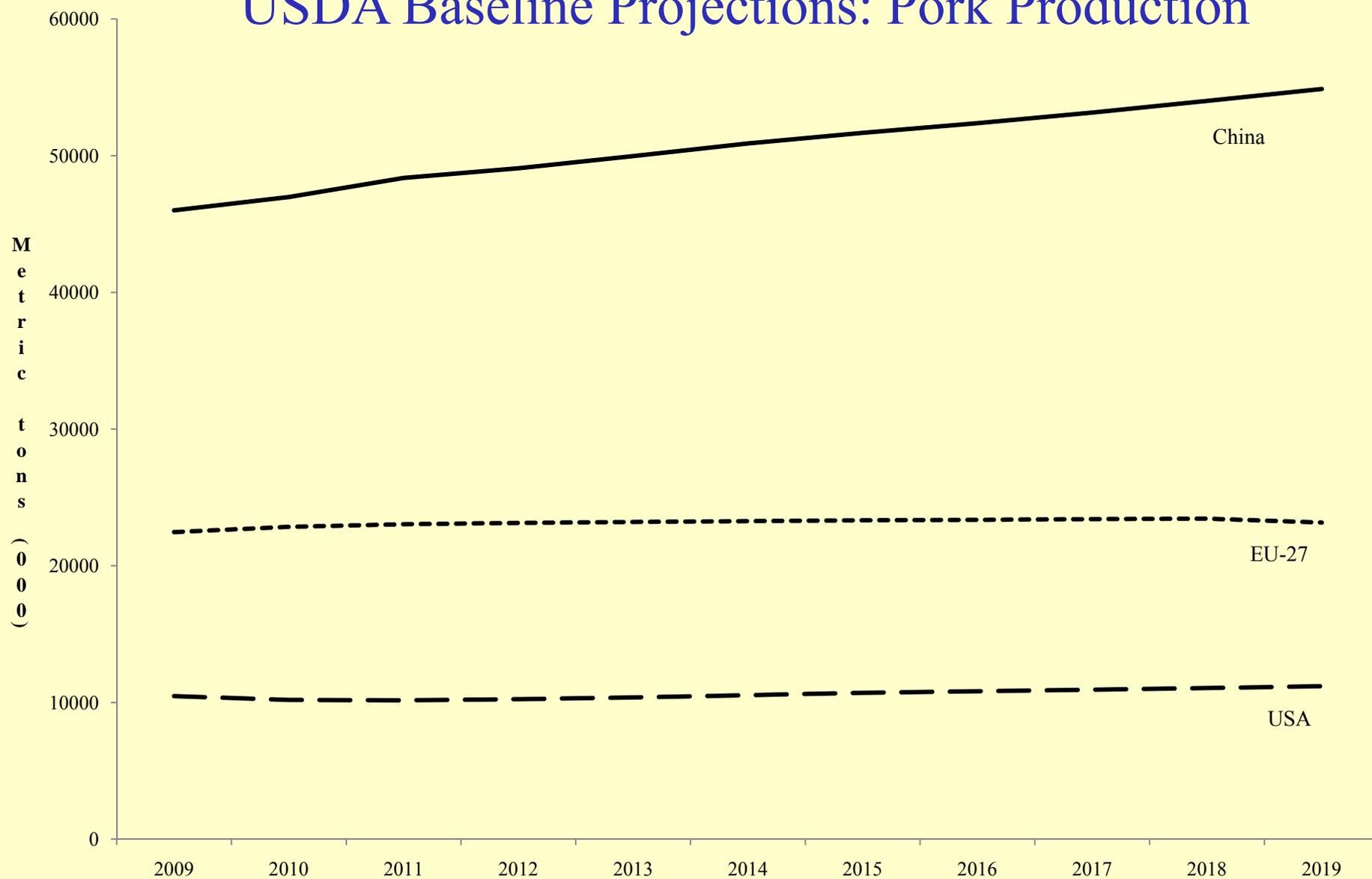
Outline

- Country projections, from USDA baseline
 - Summarize the key implications
 - Highlight some crucial assumptions
- Farm structure
 - Shifts to larger farms: description and analysis
 - Implications for finance and business links
 - Risks and contractual arrangements

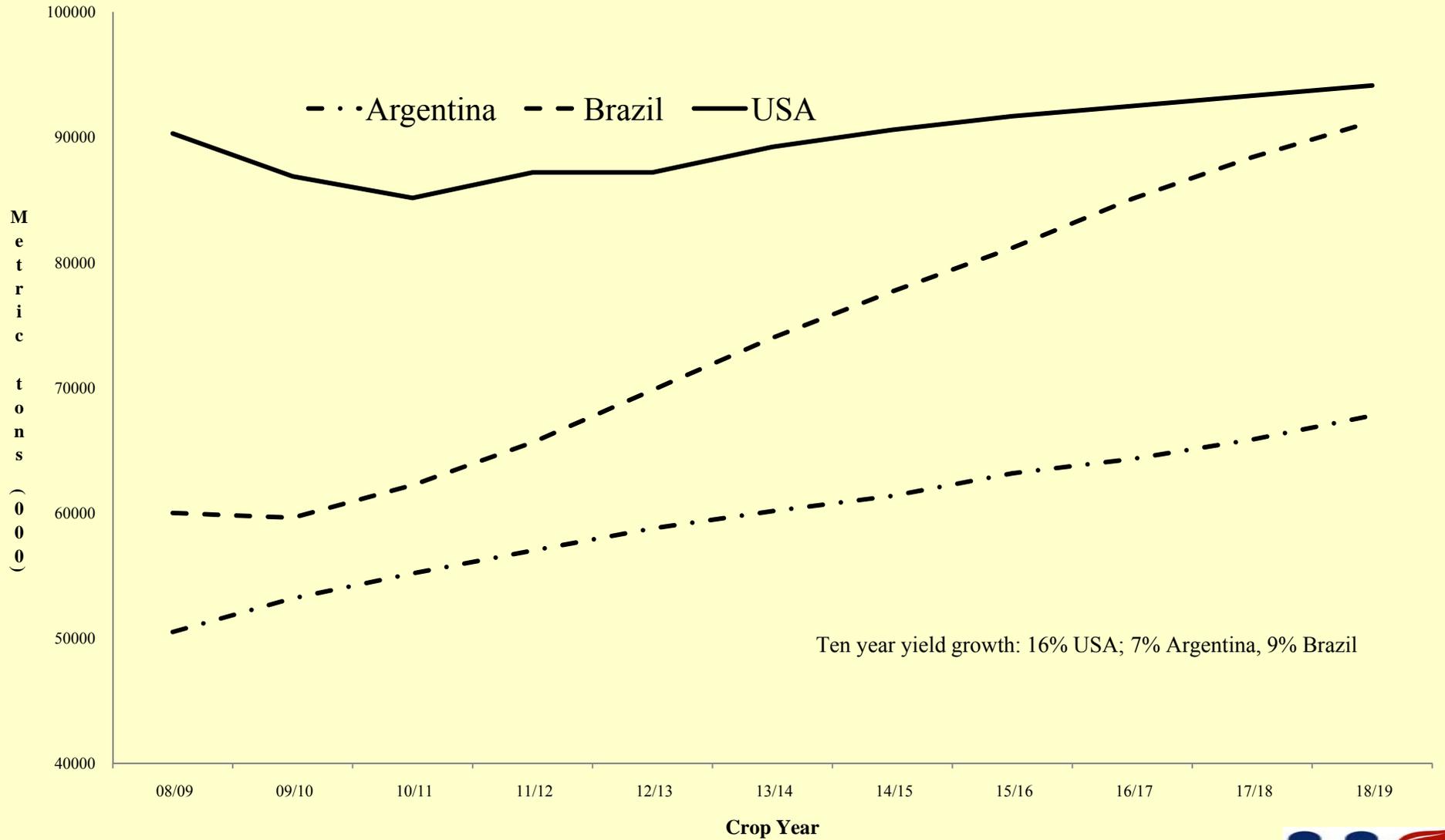
USDA Baseline Projections: Poultry Production



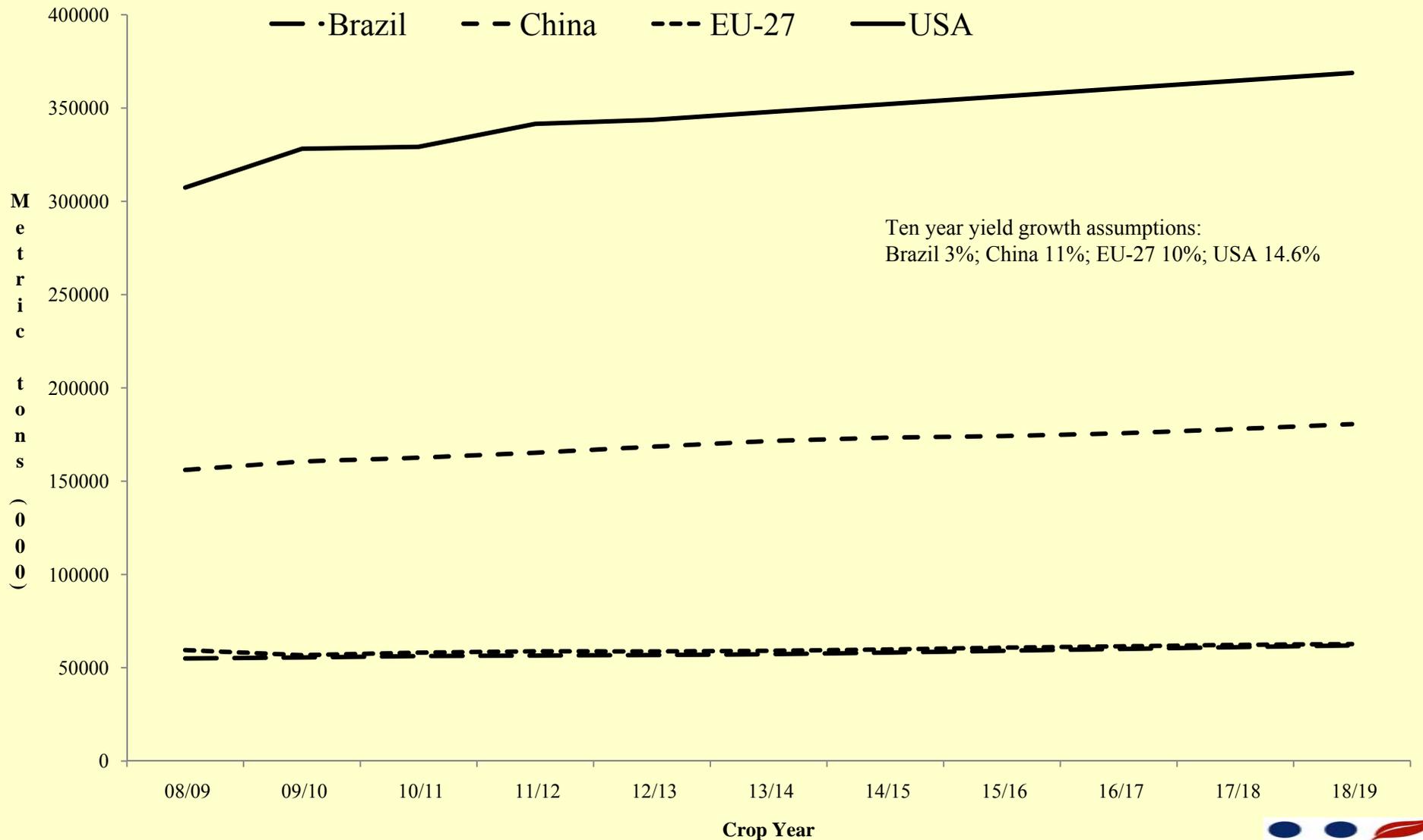
USDA Baseline Projections: Pork Production



USDA Baseline Projections: Soybean Production



USDA Baseline Projections: Corn Production



Impacts, 2009-2019

- Dietary change toward meat, feed grains
- Production increases
 - Pork & poultry (much of it in consuming countries)
 - Soybean acreage in South America
- Separately, expansions in horticultural production & trade

Baseline Assumptions, 2009-2019

- High real GDP growth in China and India
- Real increases in crude oil prices
 - \$100/bb, no change in bio-fuels policies
- Corn at \$3.65, wheat at \$4.75, soy at \$9.20
- Long-term dollar depreciation

Productivity Sensitivities

- The projections assume trend US yield ↑
 - But flattening Brazilian yield growth
- Brazil has invested in R&D...
 - What happens with continuing ↑ in yields?
- More broadly, outcomes are quite sensitive to productivity growth (yields, feed conversion, post-harvest retention, etc).

Demand Sensitivities

- China is running an enormous current account surplus (as are other Asian countries)
 - Implies forced savings and reduced consumption
- We assume little change in this basic posture
 - Which also implies CA deficits in US
- What happens if this changes?

Farm Structure

- A skewed distribution wherever we look
 - Requires care with statistics
- Shifts of production to larger farms
 - And, larger farms contract more
- U.S.: more very small farms
 - Hollowing the middle
- Brazil: More midsize farms too

US Farm Structure, 1982-2007

	Farms		Market Value of Sales (millions of 2007 \$)	
	1982	2007	1982	2007
Total	2,240,976	2,204,793	189,151	297,220
Sales Class	-Distribution of farms and sales, by sales class-			
Less than \$10,000	42.6	59.8	1.8	0.9
\$10,000-\$249,999	50.8	30.7	40.8	14.2
\$250,000-\$999,999	5.9	7.0	30.0	25.7
\$1,000,000 or more	0.7	2.5	27.4	59.2
All	100.0	100.0	100.0	100.0

Source: USDA National Agricultural Statistics Service, Census of Agriculture



Brazilian Farm Structure, 1996-2006

	Farms		Market Value of Sales (millions of 2006 R\$)	
	1996	2006	1996	2006
Total	4,624,617	4,900,876	44,544	55,982
Sales Class	-Distribution of farms and sales, by sales class (%)-			
Less than \$R10,000	74.3	63.5	11.9	7.2
\$R10,000-249,999	25.7	36.1	76.2	59.1
\$R250,000-999,999	0.07	0.4	11.9	22.9
\$R1,000,000 or more	0.0	0.02	0.0	10.8
All	100.0	100.0	100.0	100.0

Source: IBGE, Agricultural Census



The U.S. Production Shift is Ubiquitous

- Persistent over time
- Across most commodities
- And large

U.S. Structural Change: Livestock

The midpoint farm size:
half of production is on larger farms

Livestock	1987	2007
	Herd size	
Dairy	80	570
	Head Removed	
Broilers	300,000	681,600
Hogs	1200	30,000
Fattened Cattle	17,532	35,000
Cattle, <500 lbs	50	128

Source: Census of Agriculture



U.S. Structural Change: Field Crops

The midpoint farm size:
half of harvested acres are on larger farms

Field crops	1987	2007
	-Harvested acres-	
Corn	200	600
Soybeans	243	490
Wheat	404	910
Cotton	450	1090
Rice	295	700

Source: Census of Agriculture



U.S. Structural Change; Vegetables

The midpoint farm size:
half of harvested acres are on larger farms

Vegetables	1987	2007
	-Harvested acres-	
Asparagus	160	240
Lettuce	949	1815
Peppers, Bell	88	300
Potatoes	350	990
Sweet Corn	100	250
Tomatoes	400	820

Source: Census of Agriculture



U.S. Structural Change: Fruits

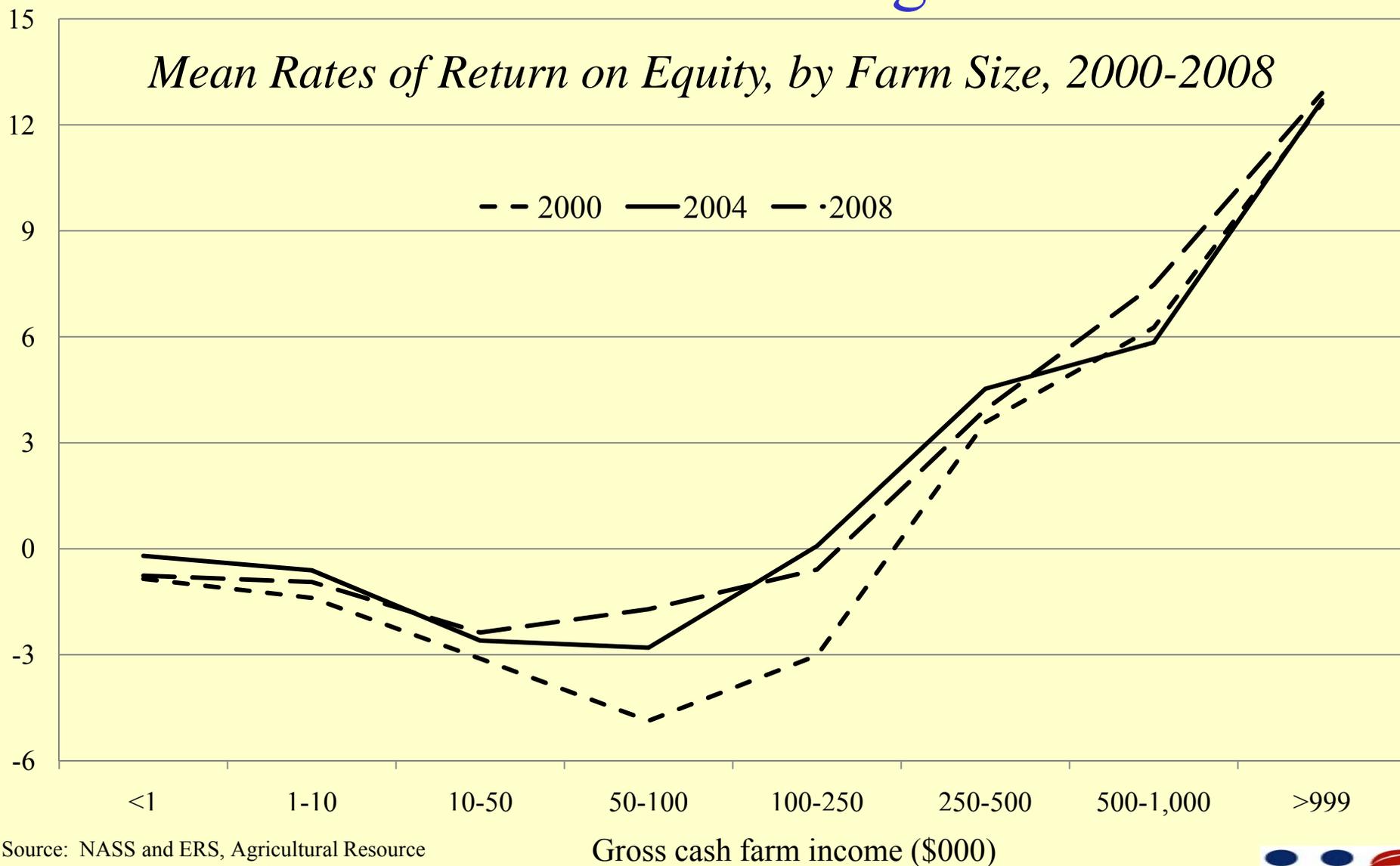
The midpoint farm size:
half of harvested acres are on larger farms

Fruits	1987	2007
	-Harvested Acres-	
Apples	83	146
Almonds	203	450
Oranges	450	1113
Peaches	92	120

Source: Census of Agriculture



Finances Are a Driving Force



Source: NASS and ERS, Agricultural Resource Management Survey, selected years.



Drivers of Structural Change

- Scale economies?
 - Evidence strong for livestock, not for crops
- Technology and farm scope?
 - Seeds, equipment
 - Expands reach of an operator?
- Do commodity payments play a role?

Large Size--Large Capital Requirements?

- \$5m for 1100 acres of corn & soybeans
 - Land, equipment, structures
- \$7m for 1000 milk cows & cropping
 - Livestock, land, structures, equipment
- \$0.5m for small-scale broiler/hog entry
 - Two houses, production contract

These are farm business assets, and exclude assets accessed through contract or custom hire

Farm Size and Farm Organization

- Farms are still closely held operations
 - And that makes sense
- But size matters
 - Scale economies and technology
- And that means growing capital requirements
- Is there a conflict?

Farms Find Many Ways to Assemble Capital

- Land rental
 - Land, equipment, structures
- Equipment/service sharing & rental
- Production and marketing contracts
- Shared ownership of assets
- Equity participation

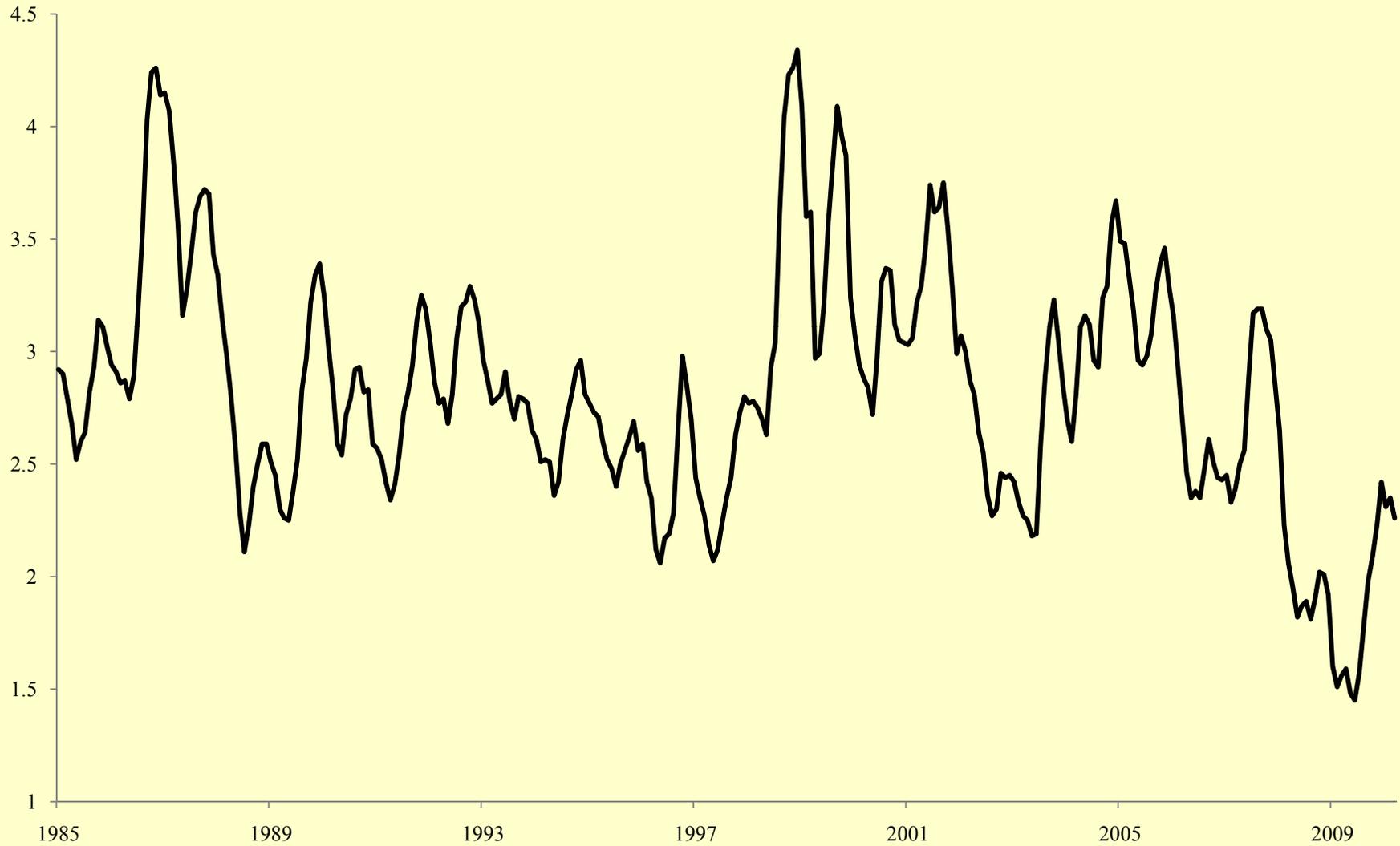
New Challenges for Farm Surveys

- Complex 3-way contracts
 - Asset owner, farm operator, integrator
- Complex farm business structures
 - Linking land, physical capital, services
- Multi-unit farm businesses
- Complex land contracts
 - Leases vs. rents; cash & share

Prices, Risks, and Debt

- Current sector situation isn't alarming...
- But for hogs and dairy, and that matters
 - Major structural changes
 - Innovative business relationships
 - Lots of debt

Monthly U.S. Milk-Feed Price Ratios, 1985-2010



Challenges

- Financial failures
 - Hogs: NC integrators
 - Dairy: Vreba-Hoff financing problems
 - Poultry: slowing growth, aging capital stock
 - Price risks unlikely to go away
- But scale advantages are real
 - Absent major changes in relative input prices
- Do we need new instruments for managing and allocating risks?

Conclusions

- Geography: What odds do we put on...
 - Asian growth and dietary shift?
 - Productivity growth projections?
 - \$100/bb real oil prices? \$50? \$200?
- Structure
 - Production to larger farms, still closely held
- Risks and financing challenges
 - Follow from the above

For More Information

- Data on US farms
 - ERS data tool at <http://www.ers.usda.gov/Data/ARMS/>
 - ERS briefing rooms at <http://www.ers.usda.gov/>
- James MacDonald
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